Chapter 13. Using Extended Screen and Keyboard Control

Contents

Introduction

With DOS Version 2.00 you can issue special character sequences from within your program that can be used to control screen cursor positioning. You can also reassign the meaning of any key in the keyboard.

Notes:

1. The control sequences defined below are valid only when issued through DOS function calls 1, 2, 6, and 9, and require the presence of the extended screen and keyboard control device driver. This can be accomplished by placing the command:

   ```
   DEVICE=ANSI.SYS
   ```

   In your CONFIG.SYS (configuration) file. Note that the size of DOS in memory will be increased by the size of the ANSI.SYS program.

2. The default value is used when no explicit value, or a value of zero, is specified.

3. # - Numeric Parameter. A decimal number specified with ASCII characters.

4. In the control sequences described below, ESC is the 1 byte code for ESC (hex 1B), *not* the three characters "ESC." For example, ESC [2;10H could be created under DEBUG as follows:

   ```
   e200 1B "[2;10H"
   ```

Cursor Control

Cursor Position

CUP	Function
ESC [#;# H	Moves the cursor to the position specified by the parameters. The first parameter specifies the line number and the second parameter specifies the column number. The default value is one. If no parameter is given, the cursor is moved to the home position.

Cursor Up

CUU	Function
ESC [# A	Moves the cursor up one line without changing columns. The value of # determines the number of lines moved. The default value for # is one. This sequence is ignored if the cursor is already on the top line.

Cursor Down

CUD	Function
ESC [# B	Moves the cursor down one line without changing columns. The value of # determines the number of lines moved. The default value for # is one. The sequence is ignored if the cursor is already on the bottom line.

Cursor Forward

CUF	Function
ESC [# C	Moves the cursor forward one column without changing lines. The value of # determines the number of columns moved. The default value for # is one. This sequence is ignored if the cursor is already in the rightmost column.

Cursor Backward

CUB	Function
ESC [# D	Moves the cursor back one column without changing lines. The value of # determines the number of columns moved. The default value for # is one. This sequence is ignored if the cursor is already in the leftmost column.

Horizontal and Vertical Position

HVP	Function
ESC [#;#f	Moves the cursor to the position specified by the parameters. The first parameter specifies the line number and the second parameter specifies the column number. The default value is one. If no parameter is given, the cursor is moved to the home position (same as CUP).

Device Status Report

DSR	Function
ESC [6n	The console driver will output a CPR sequence on receipt of DSR (see below).

Cursor Position Report

CPR	Function
ESC [#;#R	The CPR sequence reports the current cursor position through the standard input device. The first parameter specifies the current line and the second parameter specifies the current column.

Save Cursor Position

SCP	Function
ESC [s	The current cursor position is saved. This cursor position can be restored with the RCP sequence.

Restore Cursor Position

RCP	Function
ESC [u	Restores the cursor to the value it had when the console driver received the SCP sequence.

Erasing

Erase in Display

ED	Function
ESC [2J	Erases all of the screen and the cursor goes to the home position.

Erase in Line

EL	Function
ESC [k	Erases from the cursor to the end of the line and includes the cursor position.

Set Graphics Rendition

SGR	Function
ESC [#;...;#m	Sets the character attribute specified by the parameter(s). All following characters will have the attribute according to the parameter(s) until the next occurrence of SGR.

Parameter	Meaning
0	All attributes Off (normal white on black)
1	Bold On (high intensity)
4	Underscore On (IBM Monochrome Display only)
5	Blink On
7	Reverse video On
8	Cancelled On (invisible)
30	Black foreground
31	Red foreground
32	Green foreground
33	Yellow foreground
34	Blue foreground
35	Magenta foreground
36	Cyan foreground
37	White foreground
40	Black background
41	Red background
42	Green background
43	Yellow background
44	Blue background
45	Magenta background
46	Cyan background
47	White background

Set Mode

SM	Function
ESC [=#h or ESC [=h or ESC [=0h or ESC [?7h	Invokes the screen width or type specified by the parameter. Parameter Meaning 0 40x25 black and white 1 40x25 color 2 80x25 black and white 3 80x25 color 4 320x200 color 5 320x200 black and white 6 640x200 black and white 7 wrap at end of line (typing past end-of-line results in new line)

Reset Mode

RM	Function
ESC [=#l or ESC [=l or ESC [=0l or ESC [?7l	Parameters are the same as SM (Set Mode) except that parameter 7 will reset wrap at end-of-line mode (characters past end-of-line are thrown away).

Keyboard Key Reassignment

The control sequence is	Function
ESC [#;#;...#p or ESC ["string";p or ESC [#;"string";#; #;"string";#p or any other combination of strings and decimal numbers	The first ASCII code in the control sequence defines which code is being mapped. The remaining numbers define the sequence of ASCII codes generated when this key is intercepted. However, if the first code in the sequence is zero (NUL) then the first and second code make up an extended ASCII re-definition (see the "Technical Reference" for a list of all ASCII and extended ASCII codes).

Here are some examples:

1. Reassign the Q and q key to the A and a key (and the other way as well):

```
ESC [65;81p   A becomes Q
ESC [97;113p  a becomes q
ESC [81;65p   Q becomes A
ESC [113;97p  q becomes a
```

2. Reassign the F10 key to a DIR command followed by a carriage return:

```
ESC [0;68;"dir";13p
```

The 0;68 is the extended ASCII code for the F10 key. 13 decimal is a carriage return.